

**REMARKS**

Claims 1-23 are all the claims pending in the application. By this Amendment, Applicant amends claims 1 and 20 to further clarify the invention. In addition, Applicant adds claims 21-23, which are clearly supported throughout the specification.

**I. Summary of the Office Action**

The Examiner withdrew the previous grounds for a rejection. The Examiner, however, found new grounds for rejecting the claims. The Examiner further withdrew the allowability of claims 2-4, 7, 15-17, and 19 in view of this newly found reference. Specifically, claims 1-7, 9, 11-17, 19, and 20 presently stand rejected, claims 8 and 10 are allowed, and claim 18 contains allowable subject matter.

**II. Prior Art Rejections**

Claims 1, 3-6, 9, 11-17, 19, and 20 are rejected under 35 U.S.C. § 103(a) as being unpatentable over a newly found reference, U.S. Patent No. 7,054,559 to Le et al. (hereinafter “Le”) in view of U.S. Patent No. 6,195,480 to Kosaka et al. (hereinafter “Kosaka”). Applicant respectfully traverses these grounds of rejection in view of the following comments.

Of these rejected claims, only claim 1 is independent. Independent claim 1, among a number of unique features, recites: “wherein each one of the set of channel regenerators regenerates, by compensating for a distortion of a signal, only a predetermined respective group of channels, each respective group forming a non-overlapping subset of a set of channels to be regenerated, and each channel of the groups is predetermined based on channel wavelength, wherein each channel regenerator is positioned at a predetermined distance on the optical line from other channel regenerators from said at least one set of channel regenerators and said each

channel regenerator is positioned in series with respect to other channel regenerators from said at least one set of channel regenerators....”

That is, in an exemplary, non-limiting embodiment of the present invention, successive regenerators regenerate their respective group of channels (*e.g.*, page 3, lines 9 to 13 of the specification). In other words, in an exemplary embodiment of the present invention, the regenerators are placed sequentially, in series on the same optical line but only regenerate their respective set of channels. Thus, the structure of the regenerators is simplified and the equipment as a whole is simplified. Instead of having points on the optical fiber line, where all the channels are regenerated, the channels are regenerated in series or sequentially. Only a subset of channels are regenerated at a particular point on the optical fiber line. It will be appreciated that the foregoing remarks relate to the invention in a general sense, the remarks are not necessarily limitative of any claims and are intended only to help the Examiner better understand the distinguishing aspects of the claims mentioned above.

The Examiner contends that Le discloses positioning the regenerators in series such that each regenerator regenerates only a subset of the channels. Specifically, the Examiner contends that Le’s channels in the red wavelength band would be regenerated by 210 and channels in the green wavelength band would be regenerated by 230, Fig. 2 of Le (*see* page 5 of the Office Action). Applicant respectfully submits that the above-described elements of Le do not suggest positioning the regenerators in series on the optical fiber line to regenerate different sets of channels.

Le discloses a system and method for modular multiplexing and amplification of optical signals in subwindows within an operating window of a fiber optic communication network. An

operating window is divided into subwindows. Each subwindow corresponds to a different group of channels having optical signals of a different wavelength. Optical signals in each subwindow are optically amplified separately and in parallel by a plurality of optical line amplifiers. Modular wavelength division multiplexing (WDM) units multiplex/demultiplex optical signals in the set of multiple channels. A modular WDM unit includes a coarse WDM unit and four fine WDM units. The coarse WDM multiplexes optical signals by wavelength into subwindows separated by relatively large guard bands. A fine WDM unit further multiplexes optical signals within a subwindow by wavelength into individual channels with a fine separation. Fine WDM units and optical line amplifiers can be added in a modular fashion, as needed, to support actual or anticipated traffic in the corresponding subwindows and channels therefor. Dispersion magnitude and slope can be managed across channels within subwindows without expensive equalization circuits (*see* Abstract and col. 3, lines 33 to 43).

In other words, Le discloses amplifying optical signals in each subwindow “separately and in parallel” (Fig. 2; col. 3, lines 37 to 43 and col. 6, lines 8 to 18). That is, in Le, “a plurality of optical line amplifiers 210, 220, 230, 240 are disposed *along parallel optical fibers* (not shown) that carry optical traffic between first and second multiplexing units 202, 262. Optical line amplifiers 210, 220, 230, 240 amplify four respective subgroups of optical signals corresponding to four subwindows within the erbium band operating window. The four groups of optical signals are referred to herein as “red”, “blue”, “green”, and “yellow” optical signals for notational convenience only to help delineate the four different groups within the erbium band” (col. 6, lines 8 to 18).

In short, Le discloses providing multiple optical fiber lines placed in parallel for various channels. Le does not disclose or suggest having one optical fiber line having amplifiers that would amplify different set of channels. Furthermore, Le discloses that the amplifiers are placed in parallel to amplify its respective group of channels but does not disclose or suggest placing these amplifiers in series.

Kosaka is only cited for its disclosure of a transmitter and a receiver (*see* page 3 of the Office Action) and as such does not cure the deficient disclosure of Le.

Therefore, “wherein each one of the set of channel regenerators regenerates, by compensating for a distortion of a signal, only a predetermined respective group of channels, each respective group forming a non-overlapping subset of a set of channels to be regenerated, and each channel of the groups is predetermined based on channel wavelength, wherein each channel regenerator is positioned at a predetermined distance on the optical line from other channel regenerators from said at least one set of channel regenerators and said each channel regenerator is positioned in series with respect to other channel regenerators from said at least one set of channel regenerators,” as set forth in claim 1 is not disclosed by the combined disclosure of Le and Kosaka, which lack having different amplifiers for different channels being positioned on the same optical fiber line in series. For at least these exemplary reasons, claim 1 is patentable over Le in view of Kosaka. Therefore, Applicant respectfully requests the Examiner to withdraw this rejection of claim 1 and its dependent claims 3-6, 9, 11-17, 19, and 20.

Claims 2 and 7 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Le and Kosaka in view of U.S. Patent No. 6,108,125 to Yano (hereinafter “Yano”). Applicant respectfully traverses these grounds of rejection in view of the following comments.

Claims 2 and 7 depend on claim 1. Applicant has already demonstrated that the combined disclosure of Le and Kosaka fails to suggest the unique features of claim 1. Yano fails to cure the above-identified deficiencies of Le and Kosaka. Therefore, claim 1 is patentable over the combined disclosure of Le, Kosaka, and Yano. Together, the combined disclosure of Le, Kosaka, and Yano would not have and could not have led an artisan of ordinary skill in the art to achieve the unique features of claim 1. Claims 2 and 7 are patentable at least by virtue of their dependency on claim 1.

### III. Allowable Subject Matter

Applicant thanks the Examiner for allowing claims 8 and 10 and for indicating that claim 18 contains allowable subject matter. Applicant respectfully holds the rewriting of claim 18 in abeyance until arguments presented with respect to claim 1 have been reconsidered.

### IV. New Claims

In order to provide more varied protection, Applicant adds claims 21-23, which are patentable at least by virtue of their dependency on claim 1. Furthermore, these dependent claims 21-23 recite additional features which provide separate bases for patentability.


AMENDMENT UNDER 37 C.F.R. § 1.111  
U.S. Appln. No. 09/493,091  
Attorney Docket No.: Q57709

V. Conclusion

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly invited to contact the undersigned attorney at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,

  
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WASHINGTON OFFICE

**23373**

CUSTOMER NUMBER

Date: January 25, 2007

Attorney Docket No.: Q57709